

PROBLEM:

Solve the following simultaneous equations by using complex amplitudes. Show how to convert the sinusoidal equations into complex-number equations. If we assume that the amplitudes are positive, will the answers for A_1 and A_2 be unique? How about ϕ_1 and ϕ_2 ; are there other answers for the phases?

$$2 \cos(\omega_0 t - 2\pi/3) = A_1 \cos(\omega_0 t + \phi_1) - A_2 \cos(\omega_0 t + \phi_2)$$

$$2 \cos(\omega_0 t - 3\pi) = A_1 \cos(\omega_0 t + \phi_1) + A_2 \cos(\omega_0 t + \phi_2)$$